SIMPLOT COMPANY POCATELLO (PWS 6390023)
SOURCE WATER ASSESSMENT FINAL REPORT

March 24, 2003

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment areas and sensitivity factors associated with the wells and the aquifer characteristics.

This report, *Source Water Assessment for Simplot Company Pocatello, Pocatello, Idaho*, describes the public water system (PWS), the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

Simplot Company Pocatello (PWS # 6390023) is a non-community, non-transient drinking water system located in Power County near the junction of Interstate 86 and Highway 30, approximately two miles west of the city of Chubbuck. The drinking water system is made up of three ground water wells: Well #4, Well #5, and Well #7. Well #4 is the oldest well of the system, drilled in 1954 to a depth of 229 feet. Well #5 was drilled in 1959 to a depth of 250 feet. Well #7 is the newest well, drilled in 1993 to a depth of 290 feet. Ultraviolet treatment is used for disinfection at several areas within the plant that are most likely to encounter human exposure. However, there is no treatment at the well sources. These wells provide drinking water for the 472 employees of the Simplot Company in Pocatello through one connection.

The three Simplot Company wells are in close proximity to each other and therefore, share the same delineated area. The potential contaminant sources within the capture zones for this delineation include leaking underground storage tank (LUST) sites, underground storage tank (UST) sites, above ground storage tank (AST) sites, National Pollution Discharge Elimination System (NPDES) sites, sites regulated under the Superfund Amendments and Reauthorization Act (SARA) and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), several mines and gravel pits, wastewater land application (WLAP) sites, toxic release inventory (TRI) sites, and several businesses that include fertilizer manufacturers, cleaners, construction, painting, printing. Additionally, the Geographic Information System (GIS) map shows that Interstate 86, Highway 30, the Union Pacific Railroad, and the Portneuf River intesect the delineated area. These potential contaminant sources can add inorganic chemical (IOC) contaminants, volatile organic chemical (VOC) contaminants, synthetic organic chemical (SOC) contaminants, or microbial contaminants to the aquifer in the event of an accidental spill, release, or flood. All of these sources add to the vulnerability of the Simplot Company drinking water system.

Final well susceptibility scores are derived from equally weighting potential contaminant inventory/land use scores and adding them with hydrologic sensitivity scores and system construction scores. Therefore, a low rating in one category coupled with a higher rating in another category result in a final rating of low, moderate, or high susceptibility. Potential contaminants are divided into four categories: IOCs (e.g., nitrates, arsenic), VOCs (e.g., petroleum products), SOCs (e.g., pesticides), and microbial contaminants (e.g., bacteria). As a well can be subject to various contamination settings, separate scores are given for each type of contaminant.

For the assessment, a review of laboratory tests was conducted using the State Drinking Water Information System (SDWIS). No VOCs have been detected in Well #4 and no SOCs have been detected in Well #4 or in Well #5. The IOCs barium, antimony, mercury, fluoride, nitrate, nitrite and selenium have been detected in the drinking water but at concentrations below the maximum contaminant level (MCL) for each chemical, as established by the EPA.

The IOC arsenic has been detected at elevated levels in samples taken from all of the Simplot Company wells. Recently, in May 2002, arsenic was detected in Well #4 at 0.061 milligrams per liter (mg/L), a level greater than the newly revised MCL of 0.010 mg/L and the previous MCL of 0.050 mg/L. In October 2001, the EPA lowered the arsenic MCL from 0.050 mg/L to 0.010 mg/L, giving PWSs until 2006 to meet the new requirement. In September 1993, arsenic was also detected in Well #5 at 0.008 mg/L and in May 2002 arsenic was detected in Well #7 also at 0.008 mg/L, levels greater than one-half the current MCL. EPA requires reporting in the Consumer Confidence Report (CCR) if concentrations of detected compounds are greater than half their MCL. Further information and health side effects can be researched at http://www.epa.gov/safewater/ccr1.html.

The SOC simazine was detected in water samples taken from Well #7 in August 1995. This chemical is used as a herbicide and usually contaminates water by runoff. It can cause health problems associated with the blood.

The capture zones for the wells intersect priority areas for the IOC nitrate and the SOCs ethyl dibromide (EDB) and atrazine, chemicals used as pesticides. A nitrate priority area is described as a region where greater than 25% of the wells/springs show nitrate values greater than 5 mg/L. A priority area for pesticides is a region where greater than 25% of the wells in the area show levels greater than 1% of the primary standard or other health standards for the specified pesticide.

Dichloromethane, a VOC, was detected in samples taken from Well #5 and Well #7 in August 1995. Though this chemical is a disinfection by-product and therefore not a problem with the source water, it can cause eye, nose, and throat irritation and stomach pain. Long term exposure may lead to cancer.

Total coliform bacteria were detected repeatedly in several locations within the distribution system and at each of the wells from June 1993 to June 2000, indicating a possible pathway for contamination. Detection of total coliform bacteria in the distribution system occurred several times between May and September 1997 and again between June and August 1999, signifying a possible seasonal influence. Repeat detection of the bacteria occurred in Well #4 in October 1993 and again from July to September 1999. In Well #5, total coliform bacteria were detected repeatedly in June 1993, June 1997, and July 1999. In Well #7, the bacteria were repeatedly detected in July 1999.

In terms of total susceptibility, all of the Simplot Company Pocatello wells rated high for IOCs, SOCs, and microbial contaminants. Well #4 and Well #5 rated high and Well #7 rated moderate for VOCs. Repeated detections of total coliform bacteria at the wellheads resulted in automatic high susceptibility ratings for microbial contaminants for all of the wells. The detection of the SOC simazine at Well #7 in 1995 resulted in an automatic high susceptibility score for SOCs for that well. The 1997 sanitary survey (conducted by the Southeastern District Health Department) indicates that a nonpotable water pipeline runs directly above Well #5, resulting in automatic high susceptibility ratings for all potential contaminant categories for Well #5. The predominant irrigated agricultural land use of the area as well as the priority area of the pesticides ethylene dibromide (EDB) and atrazine within the delineation contributed greatly to the overall susceptibility of the system. Hydrologic sensitivity for all of the wells was moderate and system construction was high for Well #4 and Well #5 and was moderate for Well #7. Potential contaminant inventory/land use was high for IOCs, VOCs, and SOCs, and moderate for microbial contaminants for the Simplot Company Pocatello wells.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well or spring sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For Simplot Company Pocatello, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Attention should be given to the non-potable water pipeline that runs above Well #5 to avoid contamination of the well associated with this contaminant source. If microbial contamination continues to be a problem, the Simplot Company Pocatello may need to consider a routine disinfection system as a water treatment solution.

Also, the Simplot Company Pocatello may need to implement engineering controls to reduce or eliminate the detection of SOCs and to reduce the levels of arsenic detected in the system to meet the new MCL. EPA (2002) recently released an issue paper entitled *Proven Alternatives for Aboveground Treatment of Arsenic in Groundwater* and *Arsenic Treatment Technologies for Soil, Waste, and Water* to assist PWSs in meeting the new arsenic standard.

As land uses within most of the source water assessment areas are outside the property boundary of Simplot Company Pocatello, collaboration and partnerships with state and local agencies and industry groups should be established and are critical to success. Educating employees and the public about source water will further assist the system in its monitoring and protection efforts.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include household hazardous waste disposal methods and the importance of water conservation. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Power Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g. zoning, permitting) or non-regulatory in nature (e.g. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR SIMPLOT COMPANY POCATELLO, POCATELLO, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water supply system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the public water system (PWS).**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

Simplot Company Pocatello PWS (# 6390023) is a non-community, non-transient drinking water system located in Power County near the junction of Interstate 86 and Highway 30, approximately two miles west of the city of Chubbuck (see Figure 1). The drinking water system is made up of three ground water wells: Well #4, Well #5, and Well #7. Well #4 is the oldest well of the system, drilled in 1954 to a depth of 229 feet. Well #5 was drilled in 1959 to a depth of 250 feet. Well #7 is the newest well, drilled in 1993 to a depth of 290 feet. Ultraviolet treatment is used for disinfection at several areas within the plant that are most likely to encounter human exposure. However, there is no treatment at the well sources. These wells provide drinking water for the 472 employees of the Simplot Company in Pocatello through one connection.
No volatile organic chemicals (VOCs) have been detected in Well #4 and no synthetic organic chemicals (SOCs) have been detected in Well #4 and Well #5. The inorganic chemicals (IOCs) barium, antimony, mercury, fluoride, nitrate, nitrite and selenium have been detected in the drinking water but at concentrations below the maximum contaminant level (MCL) for each chemical, as established by the EPA.

The IOC arsenic has been detected at elevated levels in samples taken from all of the Simplot Company wells. Recently, in May 2002, arsenic was detected in Well #4 at 0.061 milligrams per liter (mg/L), a level greater than the newly revised MCL of 0.010 mg/L and the previous MCL of 0.050 mg/L. In October 2001, the EPA lowered the arsenic MCL from 0.050 mg/L to 0.010 mg/L, giving PWSs until 2006 to meet the new requirement. In September 1993, arsenic was detected in Well #5 at 0.008 mg/L and in May 2002 arsenic was detected in Well #7 also at 0.008 mg/L, levels greater than one-half the current MCL. EPA requires reporting in the Consumer Confidence Report (CCR) if concentrations of detected compounds are greater than half their MCL. Further information and health side effects can be researched at http://www.epa.gov/safewater/ccr1.html.

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The capture zones for the wells intersect priority areas for the IOC nitrate and the SOCs ethyl dibromide (EDB) and atrazine, chemicals used as pesticides. A nitrate priority area is described as a region where greater than 25% of the wells/springs show nitrate values greater than 5 mg/L. A priority area for pesticides is a region where greater than 25% of the wells in the area show levels greater than 1% of the primary standard or other health standards for the specified pesticide.

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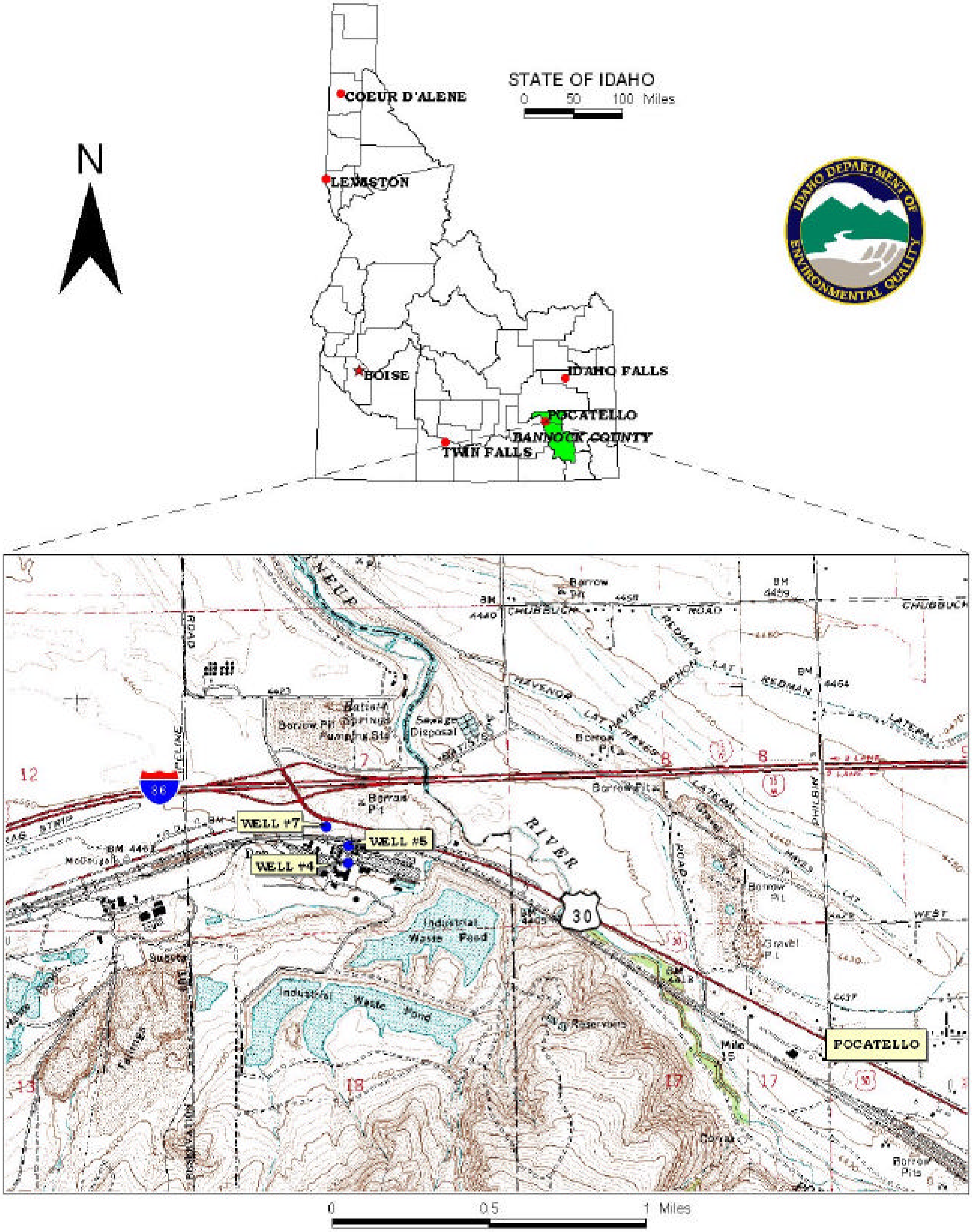
Total coliform bacteria were detected repeatedly in several locations within the distribution system and at each of the wells from June 1993 to June 2000, indicating a possible pathway for contamination. Detection of total coliform bacteria in the distribution system occurred several times between May and September 1997 and again between June and August 1999, signifying a possible seasonal influence.

FIGURE 1. Geographic Location of Simplot Company Pocatello



Repeat detection of the bacteria occurred in Well #4 in October 1993 and again from July to September 1999. In Well #5, total coliform bacteria were detected repeatedly in June 1993, June 1997, and July 1999. In Well #7, the bacteria were repeatedly detected in July 1999.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. WGI was contracted by DEQ to define the public water system's zones of contribution. However, DEQ is currently producing a hydrogeologic/chemical report on the Eastern Michaud Flats area that may be useful in further defining the delineations and the potential contaminants in the area. The initial draft of the document was produced in August 2001 (Joe Baldwin, personal communication, Feb.18, 2003).

For the current delineations, WGI used a refined method using the WhAEM 2000 (Kraemer et al., 2000) model approved by the Source Water Assessment Plan (DEQ, 1999) in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) time of travel (TOT) zones for water associated with the "Eastern Margin of the East Snake River Plain in the Arbon Valley" hydrologic province in the vicinity of the New Simplot Company Pocatello wells. The computer model used site specific data, assimilated by WGI from a variety of sources including operator records and hydrogeologic reports. A summary of the hydrogeologic information from the WGI is provided below.

Hydrogeologic Conceptual Model

The East Margin Area encompasses 821 square miles, representing approximately 8 percent of the total area of the ESRP hydrologic province. The majority of the East Margin Area is within Bingham County, with small areas occurring in Bannock, Bonneville, and Power counties.

The regional ESRP aquifer is the most significant aquifer in the East Margin Area and consists primarily of basalt of the Quaternary Snake River Group. However, additional hydrostratigraphic units are used for water supply along the margin of the ESRP. In order of decreasing age, the most significant aquifers in the Michaud Flats area are bedded rhyolite of the Tertiary Starlight Formation and Quaternary-aged pediment gravels, basalt of the Big Hole Formation, and alluvium of the Sunbeam Formation (Jacobson, 1982, p. 7, and Corbett, et al., 1980, pp. 6-10). A few shallow domestic wells in the central Michaud Flats area also are completed in Michaud Gravel, which is the shallow alluvial water-table aquifer. The American Falls Lake Beds Formation (AFLB) confines the deeper aquifers and averages 80 feet in thickness in the central Michaud Flats area (Jacobson, 1984, p. 6). The AFLB pinches out in the eastern Michaud Flats area near the Portneuf River, effectively combining the shallow and deep alluvium into a single water table aquifer (Bechtel, 1994, p. 2-2). Other aquifers in the East Margin Area include fractured quartzite that has been developed near Blackfoot, alluvium near the cities of Firth and Basalt, and pediment gravels in the Gibson Terrace area near Tyhee and Chubbuck.

The Simplot Company Pocatello wells are completed in the alluvial aquifer in the eastern Michaud Flats area near the Portneuf River. The average hydraulic conductivity for the alluvial aquifer in this area is 318 ft/day, based upon 18 slug tests conducted during a remedial investigation (Bechtel, 1996, Figure 3.3-7B). Analysis of specific capacity data from PWS wells completed in the alluvial aquifer using the method of Walton (1962) results in estimates of hydraulic conductivity ranging from 291 to 361 feet per day (ft/day), with a geometric mean of 321 ft/day.

The direction of ground water flow is generally to the north and northwest. Hydraulic gradients range from 1.0 to 5.0 feet per mile (ft/mi) (0.0002 to 0.0009; Jacobson, 1984, p. 14). In areas closest to the Portneuf River, ground-water flow is more easterly, toward the river (Bechtel, 1996, Figure 3.3-9, and Spinazola et al., 1997, p. 16).

The hydrology of the eastern Michaud Flats is affected by the presence of a large gypsum impoundment. Gypsum is slurried into the impoundment at a rate of 1,500 gallons per minute (gal/min), and an estimated 500 gal/min recharges the alluvial aquifer (Bechtel, 1994, p. 2-8). Published estimates for recharge in the eastern Michaud Flats area vary by more than an order of magnitude. Bechtel (1994, p. 2-7) indicates an average recharge of 1.09 inches per year (in./yr), whereas Garabedian (1992, Plate 8) indicates a value of between 15 and 20 in./yr.

Capture zones for the Simplot Company Pocatello wells were delineated using the analytical element model WhAEM2000 (Kraemer et al., 2000). The areas of the 3-, 6-, and 10-year TOTs are 1.85, 5.02, and 10.35 square miles, respectively (see Figure 2 in Appendix A). The actual data used in determining the source water assessment delineation area is available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act. Furthermore, these sources have a sufficient likelihood of releasing such contaminants into the environment at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Field surveys conducted by DEQ and reviews of available databases identified potential contaminant sources within the delineated area (see Table A-1 in Appendix A).

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply source.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in 2002 and 2003. The first phase involved identifying and documenting potential contaminant sources within the Simplot Company Pocatello source water assessment area through the use of computer databases, sanitary surveys, and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the delineated areas. This was done with the assistance of Mr. Norman Self. At the time of the enhanced inventory, three above ground storage tanks (ASTs) were added to the inventory. A map with the well locations, the delineated area, and potential contaminant sources are provided with this report (see Figure 2 in Appendix A). The potential contaminant sources have been listed in Table A-1 in Appendix A.

Section 3. Susceptibility Analyses

The wells' susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic sensitivity, well construction, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for the wells is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors. These factors are surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquitard) above the producing zone of the well. Slowly draining soils such as silt and clay have better filtration capabilities and therefore are typically more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity was rated moderate for all three of the Simplot Company Pocatello wells. This is based upon poor to moderately drained soil classes as defined by the National Resource Conservation Service (NRCS). Soils that have poor to moderate drainage characteristics have better filtration capabilities than faster draining soils. However, though there were some clay layers, there were not enough slowly draining soils within the lithology of the wells to create aquitards above the producing zones. Additionally, the well logs indicated that the vadose zones consisted of mostly gravel and boulders and that the first ground water for Well #4 was found at 57 feet below ground surface (bgs), at 58 feet bgs for Well #5, and at 32.5 feet bgs for Well #7.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

Well #4 was drilled in 1954 to a depth of 229 feet bgs. It has a 0.250-inch thick, 20-inch diameter casing set to 20 feet bgs into gravel and boulders followed by a 0.313-inch thick, 20-inch diameter casing from 20 feet bgs to 229 feet bgs into sand and broken lava. Information regarding an annular seal was not available. The casing is perforated from 110 feet to 120 feet bgs and again from 120 feet to 180 feet bgs. The static water level is found at 57 feet bgs.

Well #5 was drilled in 1959 to a depth of 250 feet bgs. It has a 0.313-inch thick, 20-inch diameter casing set to 190 feet bgs into boulders and gravel followed by a 0.250-inch thick, 16-inch diameter casing set to 250 feet bgs into boulders. As with Well #4, no information is available concerning an annular seal around the casing. The casing is perforated from 90 feet to 185 feet bgs and the static water level is found at 58 feet bgs. Well #7 was drilled in 1993 to a depth of 290 feet bgs. It has a 0.375-inch thick, 20-inch diameter casing set to 100 feet bgs into gravel, boulders, and clay followed by a 0.375-inch thick, 6-inch diameter casing set from 18 inches to 223 feet bgs into clay with some gravel. The annular seal extends down to 100 feet bgs into gravel, boulders, and clay. The casing is perforated from 180 feet to 221 feet bgs and the static water level is found at 32.5 feet bgs.

The system construction scores were rated moderate for Well #7 and high for Well #4 and Well #5 (see Table 1). The 2002 sanitary survey (conducted by the Southeastern District Health Department) states that the surface seals for all of the wells are not maintained to standards and that none of the well casings are properly vented. A surface seal should be installed so it prevents contaminants such as dust, insects, and chemicals from dropping into the well shaft. The purpose of the vent is to vent the space between the casing and the column and prevent a vacuum from forming when the pump turns on and draws down the water table. A vacuum could draw in contamination through joints or leaks in the casing or cause the well to slough. However, all the wells are located outside a 100-year floodplain and are properly protected from surface flooding. The highest producing zone of Well #7 is greater than 100 feet below the static water level, creating a buffering zone above the ground water.

The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules (1993)* require all public water systems to follow DEQ standards. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works (1997)* during construction. Under current standards, all PWS wells are required to have a 50-foot buffer around the wellhead and if the well is designed to yield greater than 50 gallons per minute (gpm) a minimum of a 6-hour pump test is required. These standards are used to rate the system construction for the well by evaluating items such as condition of wellhead and surface seal, whether the casing and annular space is within consolidated material or 18 feet below the surface, the thickness of the casing, etc. A casing diameter of 12 inches or greater requires a casing thickness of 0.375 inches and a casing diameter of 6 inches requires a casing thickness of 0.280 inches. If all criteria are not met, the public water source does not meet the IDWR Well Construction Standards. In this case, the Simplot Company Pocatello wells did not meet the well construction standards set by the IDWR.

Potential Contaminant Source and Land Use

The potential contaminant sources and land use within the delineated zones of water contribution are assessed to determine the well's susceptibility. When agriculture is the predominant land use in the area, this may increase the likelihood of agricultural wastewater infiltrating the ground water system. Agricultural land is counted as a source of leachable contaminants and points are assigned to this rating based on the percentage of agricultural land. The land use within the area surrounding the Simplot Company Pocatello wells is predominately irrigated agriculture.

In terms of potential contaminant sources, the Simplot Company Pocatello wells rated high for IOCs (e.g., nitrates), VOCs, (e.g. petroleum related products), and SOCs (e.g., pesticides), and moderate vulnerability for microbials (e.g., bacteria) (see Table 1).

Several potential contaminant sources were found within the delineated area of the Simplot Company Pocatello wells. The location of these potential contaminant sources and delineated TOT zones for the wells is shown on Figure 2 in Appendix A. Additionally, the land within the immediate area and within the surrounding area of the wells is predominantly irrigated agriculture. The delineation crosses a priority area for the pesticides ethyl dibromide (EDB) and atrazine. All of these point and non-point sources of contamination contribute to the potential contaminant inventory/land use of the wells.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, a confirmed detection of coliform bacteria at the wellhead, or any detection of a VOC or SOC will automatically give a high susceptibility rating to the well, despite the land use of the area, because a pathway for contamination already exists. In this case, total coliform bacteria were detected at all of the wells resulting in an automatic high susceptibility score for microbial contaminants. The SOC simazine was detected at Well #7, resulting in an automatic high susceptibility for SOCs. Additionally, potential contaminant sources within 50 feet of a well will automatically lead to a high susceptibility rating. The non-potable water pipeline above Well #5 resulted in automatically high susceptibility ratings to all potential contaminants for that well. Having multiple potential contaminant sources in the 0-3-year TOT zone (Zone 1B) contributes greatly to the overall ranking.

Table 1. Summary of Simplot Company Pocatello Susceptibility Evaluation

Drinking Water Source	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Potential Contaminant Inventory and Land Use				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #4	M	H	H	H	M	H	H	H	H	H(*)
Well #5	M	H	H	H	M	H	H(*)	H(*)	H(*)	H(*)
Well #7	M	H	H	H	M	M	H	H	H(*)	H(*)

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
H(*) = Automatic high score due to detection of total coliform bacteria at the wellhead, detection of SOC in the well water, or the location of a non-potable water pipeline within 50 feet of the well; and a high number of total points.

Susceptibility Summary

In terms of total susceptibility, all of the Simplot Company Pocatello wells rated high for IOCs, VOCs, SOCs, and microbial contaminants. Repeated detections of total coliform bacteria at the wellheads resulted in automatic high susceptibility ratings for microbial contaminants for all of the wells. The detection of the SOC simazine at Well #7 in 1995 resulted in an automatic high susceptibility score for SOCs for that well. The 1997 sanitary survey indicates that a nonpotable water pipeline runs directly above Well #5, resulting in automatic high susceptibility ratings for all potential contaminant categories for Well #5. The predominant irrigated agricultural land use of the area as well as the priority area of the pesticides ethylene dibromide (EDB) and atrazine within the delineation contributed greatly to the overall susceptibility of the system. Hydrologic sensitivity was moderate and system construction was high for Well #4 and Well #5 and moderate for Well #7. Potential contaminant inventory/land use was high for IOCs, VOCs, and SOCs, and moderate for microbial contaminants for the Simplot Company Pocatello wells.

No VOCs have been detected in Well #4 and no SOCs have been detected in Well #4 and Well #5. The IOCs barium, antimony, mercury, fluoride, nitrate, nitrite and selenium have been detected in the drinking water but at concentrations below the MCL for each chemical, as established by the EPA.

The IOC arsenic has been detected at elevated levels in samples taken from all of the Simplot Company wells. Recently, in May 2002, arsenic was detected in Well #4 at 0.061 mg/L, a level greater than the newly revised MCL of 0.010 mg/L and the previous MCL of 0.050 mg/L. In October 2001, the EPA lowered the arsenic MCL from 0.050 mg/L to 0.010 mg/L, giving PWSs until 2006 to meet the new requirement. In September 1993, arsenic was detected in Well #5 at 0.008 mg/L and in May 2002 arsenic was detected in Well #7 also at 0.008 mg/L, levels greater than one-half the current MCL. EPA requires reporting in the CCR if concentrations of detected compounds are greater than half their MCL. Further information and health side effects can be researched at http://www.epa.gov/safewater/ccr1.html.

The SOC simazine was detected in water samples taken from Well #7 in August 1995. This chemical is used as a herbicide and usually contaminates water by runoff. It can cause health problems associated with the blood.

The capture zones for the wells intersect priority areas for the IOC nitrate and the SOCs ethyl dibromide (EDB) and atrazine, chemicals used as pesticides. A nitrate priority area is described as a region where greater than 25% of the wells/springs show nitrate values greater than 5 mg/L. A priority area for pesticides is a region where greater than 25% of the wells in the area show levels greater than 1% of the primary standard or other health standards for the specified pesticide.

Dichloromethane, a VOC, was detected in samples taken from Well #5 and Well #7 in August 1995. Though this chemical is a disinfection by-product and therefore not a problem with the source water, it can cause eye, nose, and throat irritation and stomach pain. Long term exposure may lead to cancer.

Total coliform bacteria were detected repeatedly in several locations within the distribution system and at each of the wells from June 1993 to June 2000, indicating a possible pathway for contamination. Detection of total coliform bacteria in the distribution system occurred several times between May and September 1997 and again between June and August 1999, signifying a possible seasonal influence. Repeat detection of the bacteria occurred in Well #4 in October 1993 and from July to September 1999. In Well #5, total coliform bacteria were detected repeatedly in June 1993, June 1997, and July 1999. In Well #7, the bacteria were repeatedly detected in July 1999.

Section 4. Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well or spring sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For Simplot Company Pocatello, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. Attention should be given to the non-potable water pipeline that runs above Well #5 to avoid contamination of the well associated with this contaminant source. If microbial contamination continues to be a problem, the Simplot Company Pocatello may need to consider a routine disinfection system as a water treatment solution.

Also, the Simplot Company Pocatello may need to implement engineering controls to reduce or eliminate the detection of SOCs and to reduce the levels of arsenic detected in the system to meet the new MCL. EPA (2002) recently released an issue paper entitled *Proven Alternatives for Aboveground Treatment of Arsenic in Groundwater* and *Arsenic Treatment Technologies for Soil, Waste, and Water* to assist PWSs in meeting the new arsenic standard.

As land uses within most of the source water assessment areas are outside the direct jurisdiction of Simplot Company Pocatello, collaboration and partnerships with state and local agencies and industry groups should be established and are critical to success. Educating employees and the public about source water will further assist the system in its monitoring and protection efforts.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include household hazardous waste disposal methods and the importance of water conservation. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Power County Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g. zoning, permitting) or non-regulatory in nature (e.g. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Pocatello Regional DEQ Office	(208) 236-6160
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper (mlharper@idahoruralwater.com), Idaho Rural Water Association, at (208) 343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLA – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/L.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RCRA – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

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Appendix A

Simplot Company Pocatello Potential Contaminant Inventory Figure 2 and Table A-1

Table A-1. Simplot Company Pocatello wells, Potential Contaminant Inventory

Site #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1, 3	LUST Site- Site Cleanup Completed, Impact: Ground Water; UST Site-Closed	0-3	Database Search	VOC, SOC
2, 15	UST Site-Open; SARA Site	0-3	Database Search	VOC, SOC
4, 9	UST Site-Open; TRI Site	0-3	Database Search	IOC, VOC, SOC
5	Excavating Contractors	0-3	Database Search	IOC, VOC, SOC
6	NPDES Site-Industrial Discharge	0-3	Database Search	VOC, SOC
7	NPDES Site-Industrial Discharge	0-3	Database Search	VOC, SOC
8	NPDES Site-Municipal Discharge	0-3	Database Search	IOC, Microbials
10	CERCLA Site	0-3	Database Search	IOC, VOC, SOC
11	CERCLA Site	0-3	Database Search	IOC, VOC, SOC
12	CERCLA Site	0-3	Database Search	IOC, VOC, SOC
13	Mine-Phosphate	0-3	Database Search	IOC, VOC, SOC
14	SARA Site-Phosphate Fertilizers	0-3	Database Search	IOC, SOC, Microbials
16	SARA Site-Industrial Gases	0-3	Database Search	IOC, VOC, SOC
17	AST Site-Fertilizer	0-3	Database Search	IOC, SOC
18	AST Site	0-3	Database Search	VOC, SOC
19	WLAP Site	0-3	Database Search	IOC, VOC, SOC
20	WLAP Site	0-3	Database Search	IOC, VOC, SOC
21	AST Site	0-3	Enhanced Inventory	VOC, SOC
22	AST Site	0-3	Enhanced Inventory	VOC, SOC
23, 24, 26, 32, 35	LUST Site-Site Cleanup Completed, Impact: Unknown; Paving Contractors; UST Site-Closed; SARA Site; AST Site	3-6	Database Search, Enhanced Inventory	IOC, VOC, SOC
25	UST Site-Closed	3-6	Database Search	VOC, SOC
27, 30	Excavating Contractors; RCRA Site	3-6	Database Search	IOC, VOC, SOC
28	Roofing Contractors	3-6	Database Search	VOC, SOC
29	NPDES Site-Aquaculture	3-6	Database Search	IOC, SOC
31	Mine-Gravel Pit	3-6	Database Search	IOC, VOC, SOC
33	WLAP Site-Industrial	3-6	Database Search	IOC, VOC, SOC
34	WLAP Site-Industrial	3-6	Database Search	IOC, VOC, SOC
36	Carpet & Rug Cleaners	6-10	Database Search	IOC, VOC
37	Painters	6-10	Database Search	IOC, VOC, SOC
38	Trucking-Liquid & Dry Bulk	6-10	Database Search	IOC, VOC, SOC
39	Janitor Service	6-10	Database Search	IOC, SOC
40	Excavating Contractors	6-10	Database Search	IOC, VOC, SOC
41	Home Improvements	6-10	Database Search	IOC, VOC, SOC
42	General Contractors	6-10	Database Search	IOC, VOC, SOC
43	NPDES Site-Aquaculture	6-10	Database Search	IOC, SOC
	Interstate 86	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Interstate 86	3-6, 6-10	GIS Map	IOC, VOC, SOC
	Highway 30	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Highway 30	3-6, 6-10	GIS Map	IOC, VOC, SOC

Site #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
	Union Pacific Railroad	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Union Pacific Railroad	3-6, 6-10	GIS Map	IOC, VOC, SOC
	Portneuf River	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Portneuf River	3-6, 6-10	GIS Map	IOC, VOC, SOC

[1] LUST = leaking underground storage tank, UST = underground storage tank, AST = aboveground storage tank, NPDES = National Pollution Discharge Elimination System, RCRA = Resource Conservation and Recovery Act, SARA = Superfund Amendments and Reauthorization Act, CERCLA = Comprehensive Environmental Response Compensation and Liability Act, WLAP = wastewater land application

[2] TOT = time of travel (in years)

[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Appendix B

Simplot Company Pocatello Susceptibility Analysis Worksheets

Susceptibility Analysis Formulas

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

1. System Construction

		SCORE
Drill Date	12/1/54	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1997 and 2002
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		5

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	NO	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2

Potential Contaminant / Land Use - ZONE 1B

		IOC	VOC	SOC	Microbial
Contaminant sources present (Number of Sources)	YES	15	20	22	6
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	19	20	22	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		18	16	18	12

Potential Contaminant / Land Use - ZONE II

		IOC	VOC	SOC	Microbial
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0

Potential Contaminant / Land Use - ZONE III

		IOC	VOC	SOC	Microbial
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0

	IOC	VOC	SOC	Microbial
Cumulative Potential Contaminant / Land Use Score	28	26	28	14
4. Final Susceptibility Source Score	15	14	15	14
5. Final Well Ranking	High	High	High	High

Ground Water Susceptibility Report — Public Water System Name: SIMPLOT COMPANY POCATELLO — WELL #5
Public Water System Number 6390023 — 1/28/03 8:37:20 AM

1. System Construction

		SCORE
Drill Date	7/15/59	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1997 and 2002
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		5

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2

Potential Contaminant / Land Use - ZONE 1B

		IOC Score	VOC Score	SOC Score	Microbial Score
Contaminant sources present (Number of Sources)	YES	15	20	22	6
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	19	20	22	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		18	16	18	12

Potential Contaminant / Land Use - ZONE II

		IOC Score	VOC Score	SOC Score	Microbial Score
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0

Potential Contaminant / Land Use - ZONE III

		IOC Score	VOC Score	SOC Score	Microbial Score
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0

	IOC Score	VOC Score	SOC Score	Microbial Score
Cumulative Potential Contaminant / Land Use Score	28	26	28	14
4. Final Susceptibility Source Score	15	14	15	14
5. Final Well Ranking	High	High	High	High

Ground Water Susceptibility Report   Public Water System Name: SIMPLOT COMPANY POCATELLO   WELL #7
Public Water System Number 6390023   1/28/03 8:37:20 AM

1. System Construction		SCORE
Drill Date	5/16/93	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1997 and 2002
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	15	20	22	6
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	19	20	22	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		18	16	18	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0
Cumulative Potential Contaminant / Land Use Score		28	26	28	14
4. Final Susceptibility Source Score		14	13	14	13
5. Final Well Ranking		High	High	High	High